Ontogenetic effects on stable carbon and oxygen isotopes in tests of live (Rose Bengal stained) benthic foraminifera from the Pakistan continental margin

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Résumé en anglais	We determined the stable oxygen and carbon isotopic composition of live (Rose Bengal stained) tests belonging to different size classes of two benthic foraminiferal species from the Pakistan continental margin. Samples were taken at two sites, with water depths of about 135 and 275 m, corresponding to the upper boundary and upper part of the core region of the oxygen minimum zone (OMZ). For Uvigerina ex gr. Uvigerina semiornata and Bolivina aff. Bolivina dilatata, δ13C and δ18O values increased significantly with increasing test size. In the case of Uvigerina ex gr. U. semiornata, δ13C increased linearly by about 0.105‰ for each 100-μm increment in test size, whereas δ18O increased by 0.02 to 0.06‰ per 100 μm increment. For Bolivina aff. B. dilatata the relationship between test size and stable isotopic composition is better described by logarithmic equations. A strong positive linear correlation is observed between δ18O and δ13C values of both taxa, with a constant ratio of δ18O and δ13C values close to 2:1. This suggests that the strong ontogenetic effect is mainly caused by kinetic isotope fractionation during CO2 uptake. Our data underline the necessity to base longer δ18O and δ13C isotope records derived from benthic foraminifera on size windows of 100 μm or less. This is already common practice in down-core isotopic studies of planktonic foraminifera.
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